Prepared for CASM Users
& Prospective CASM Users

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Communication Assets Survey and Mapping Tool Data Collection Guidance Applicable to CASM Release 1.4

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1.0   Introduction

1.1   CASM Overview

The Communication Assets Survey and Mapping (CASM) tool provides the ability for representatives of public safety agencies within a state or urban area to collect, store and visualize data about agencies, communication assets and how agencies use these assets. The CASM tool is composed of two components: the Communication Assets Survey (CAS) and the Communication Assets Mapping (CAM) tool. The CAS component provides a means to enter, edit and delete information about agencies, communication assets (such as radio systems, dispatch centers, mutual aid channels/systems, gateways and radio caches) and agency usage of the assets. The CAM component provides a means to display this information in a map-based interface and analyzes the data to display agency-to-agency interoperability in various ways.

The CASM tool is web-based and requires the user to have an active internet connection in order to access both the CAS and CAM components. CAS is a website that may be accessed via any internet browser, such as Internet Explorer, Netscape Navigator or Firefox. CAM is a client application that must be downloaded, installed and executed on the user's computer, and must have access to the internet in order to operate. Authorization to view data for a particular state or urban area is controlled by the state/urban area; each user must have a user name and password in order to login.

The purpose of CASM is to:

- Provide a single repository for information about land mobile radio systems, other interoperability methods and how they are used by public safety agencies within a state or urban area.

- Provide a method to display the data.

- Provide tools to analyze the data and visualize interoperability gaps in accordance with the SAFECOM Interoperability Continuum framework.

1.2   Benefits of Using CASM

The benefits of using CASM include:

- Sharing Data: CASM makes communication assets and interoperability data available to authorized users within a state or urban area. CASM assists participating public safety agencies in understanding the interoperability methods used by neighboring agencies.

- Access to Up-to-Date Data: Repetitive data collection efforts need not be conducted once data has been entered into CASM. Maintenance of existing data is easy and may be done at any time.

- Identifying Gaps: CASM provides a number of different ways to visualize potential interoperability between agencies in an urban area or state. This information may be used to design solutions to interoperability gaps.

- Reporting Options: CASM provides seven different pre-formatted reports that may be converted to standard word processing or spreadsheet documents.

1.3   Purpose of the Document

The primary purpose of this document is to provide state or urban area level CASM users and prospective CASM users with guidance on how to go about organizing a data collection effort using CASM.

Secondarily, some prospective users have been interested in learning ahead of time the type of data will be required of them. Section 3.0 of this document outlines the data areas and data elements that are collected in CASM.

2.0   Data Collection

In order to realize the benefits of CASM, a state or urban area that chooses to use the tool must conduct a data collection effort. The scope of that effort will vary depending on the nature of the goals.

> **The benefits of using CASM are directly linked to the quality of the data that is entered.**

In other words, the more accurate and specific the data that is collected, the more valuable the data is to share and the more accurate the interoperability analysis results are to all.

While complete and specific data entry is encouraged, efforts have been made in CASM to minimize the number of required fields per data entry area. Users may enter as much data as they have at the time they are entering data then later return to these areas to further refine their entries when more information is known. Section 3.0 provides more explanation about required fields.

2.1   Determining the Goals

It is important for a state or urban area to determine the goals of the data collection effort and communicate these goals to the people that will be entering the data and using CASM.

Here are some sample urban area goals:

1. Conduct a limited data collection effort aimed at collecting data on the communication assets that provide interoperability and are used by multiple agencies, such as mutual aid talk groups on a large regional trunked radio system and regional gateways and radio caches., Identify all agencies that operate in the urban area and identify which ones use which assets.

2. Conduct a full data collection effort aimed at collecting data on all communications assets that are used by first responder agencies that operate within the urban area and surrounding region, including all day-to-day communication assets and interoperability assets (i.e., all radio systems, mutual aid channels, dispatch centers, gateways and radio caches that exist within the area and how they are used).

Here are some sample state goals:

1. Conduct a limited data collection effort aimed at collecting data on communication assets that are available to state-wide users or may be deployed anywhere in the state, such as a state trunked radio system, National Public Safety Planning Advisory Committee (NPSPAC) channels, or deployable gateways. Include state-level agencies that have jurisdiction over the state, agencies that own/manage these assets and the primary agencies that use these assets. This may be referred to as a state-level data collection effort.

2. Conduct a large data collection effort aimed at collecting data on all first responder agencies that operate within a state and include all of their communication assets and how they are used. This may be referred to as a state-wide data collection effort.

2.2 Where to Start

Data collection begins by identifying the scope of the data collection effort based on the goals. From there, the next step is to determine the list of public safety / first responder agencies/organizations that should be included in the data collection effort. These should be first responder agencies that operate within the geographic area[1] in which the data collection is taking place and that own or use radio systems, gateways, mutual aid channels, dispatch centers or radio caches.

All communication asset data entered is related to the agencies that own and use these communication assets. For example, when a user enters data about a trunked radio system, one first responder agency shall be identified as owner/ manager of the radio system and other agencies shall be identified as users of the radio system. Later in this data entry process, the owner or users shall identify which talk groups on the system are used by which agencies that use the system.

The next step is to determine which people will be entering data for the agencies, radio systems, etc. and will need to have access to CASM. These people will need user accounts created in CASM. An Administrative Manager for the state or urban area is identified and has the authority and responsibility to create user accounts.

Lastly, if there are communication assets, such as a large regional trunked radio system, that many agencies use, it is a good idea to get this data entered early in the process so

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[1] The geographic area, and jurisdictions that are associated with it, are pre-entered into CASM by the CASM Development Team when the state/urban area is setup in CASM.

that the users that represent agencies that use the system can link the agency to the radio system and identify how they use it, if the person that entered the radio system data did not already do so.

2.3   Roll-out Strategies

It is always a good idea to prepare a roll-out strategy for the data collection effort, especially if the goal is to conduct a major effort. The recommendation is to divide the effort into smaller segments; begin in one segment and expand to other segments over time. There are a number of ways to do this; here are a few ideas:

- Start in a particular county or geographic region; expand to other counties or regions once the first part is well underway.
- Start with a group of agencies based on agency discipline, such as police and fire; expand to other disciplines, such as EMS, public works, government, etc.
- Start with a group of agencies based on users of a regional radio system; expand to other systems and agencies from there.
- Follow a state/regional hierarchy of public safety agencies, starting with the Emergency Management Agency and State Police followed by county-level agencies (e.g., Sheriffs) and so on, down to the jurisdiction level desired.

2.4   CASM Data Collection Methods

2.4.1 Data Entry through CAS

The primary method of data entry is through the Communication Assets Survey (CAS) component of the CASM tool. The CAS website provides a series of forms in which to enter data about agencies, communication assets and how the agencies use these communication assets.

The CAS web forms include pick lists and automated data validation to assist users in entering data that is accurate, consistent and in keeping with other data they have entered. In addition, the CAS component includes an extensive Help section that includes a Tutorial, Frequently Asked Questions, and User Manual that may be accessed from any web form.

2.4.2 Federal Communications Commission (FCC) Data Import

Within the CAS component, users may take advantage of the FCC Data Import feature that enables users to view, select and import data based on their FCC licenses. This provides a fast, efficient method to populate the channels, structures, and transmitters for a defined radio system.

Here is how it works: Once a radio system is named and the high-level attributes have been saved, the user may initiate the FCC Import process. The process begins with the user providing a FCC call sign or using the advanced search feature to find their call sign(s). Once the call sign is verified, the user will be able to proceed through other

windows that present the channels, structures, and ultimately the repeater / base station information from which they may select, edit, and import into the CASM database.

2.4.3 Data Import Service

Oftentimes, the data that is collected in CASM is already stored in different databases in a state or urban area. If this is the case, users may take advantage of the CASM Data Import Service. The Data Import Service provides a set of flat-file templates and instructions so that users may export data from their own databases and prepare it for import to CASM by formatting it into the provided templates. Once this is done, the populated templates may be submitted to the CASM team to upload into the database. It is important to understand that data entry via the Data Import Service is best for large amounts of data and initial entry of the data. CASM cannot be synchronized with external databases at this time.

Data may be imported using this service in the areas listed below. Some data import templates may only be used in correlation with data first having been entered via the CAS data entry forms (e.g., the radio system definition must exist before its channels can be imported).

- Agencies
- Channels, as they are related to radio systems, agencies and/or radio caches
- Talk Groups, as they are related to radio systems, agencies and/or radio caches
- Structures, as they are related to radio systems
- Repeater / Base Stations as they are related to radio systems and structures
- Dispatch Centers
- Points of Contact

More information on the Data Import Service, including the templates and instructions, can be found in the CAS Help.

3.0 Data Descriptions

This section describes each basic data collection area and lists the main[2] data fields per area. By reviewing this list, the user can get a good idea about the type of data they can enter into CASM and how it is organized.

<u>**Required Fields**</u>

The tables in this section indicate whether a data field is required or optional. This means that if the user begins entering data in this area, they must provide data for the required fields. If the user does not have data to enter for a particular area, then the required fields are not applicable. To illustrate, if the user is going to enter data about an agency, they must provide the name of the agency, the discipline (police, fire, etc.) and that agency's primary jurisdiction in order to complete the form to enter new agency data. On the other hand, if the user does not have gateway data to enter because the agencies they represent

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[2] Not every data field is included in this document; only the primary data elements are listed.

do not own or manage a gateway, then they do not have to enter any data in the gateway area and the required fields are not applicable.

High-level Perspective on Data Organization

Figure 1 provides a high-level look at how data is organized in CASM.
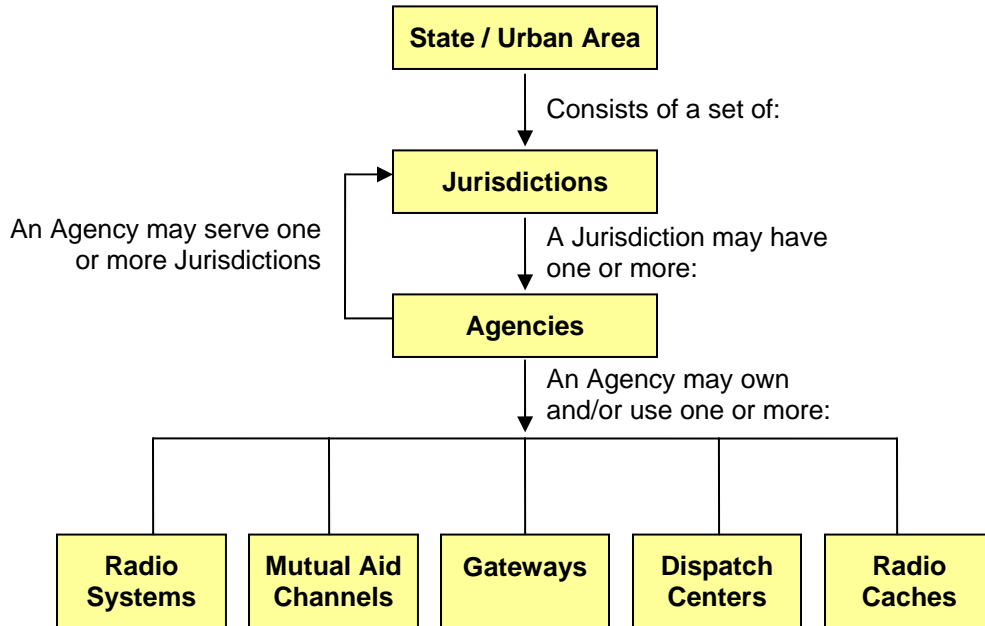

Figure 1: CASM Data Organization

The state/urban area and jurisdictions (counties, cities) that compose the state/urban area are created when the CASM tool is initiated for use by a state/urban area.

A user typically represents one or more first responder / public safety agencies and enters data about the communication assets that their agency(s) own and use. The CASM tool encourages that data entry is not duplicated. For example, if one user enters all the data for a particular radio system, all the other users that represent agencies that use that radio system do not need to enter that data also. All they need to do is indicate or verify that their agency uses the previously defined radio system and indicate the channels or talk groups that they use on that system.

3.1 Agency

Agency Definition

In CASM, an agency is defined as a first responder agency or organization such as a police department, sheriff, fire department or emergency medical service. An agency/organization may also be a health care agency, highway patrol, public health, public safety communications, public works, government or other type. It is best to think of an agency as a group of people providing a service in the interest of public safety that other public safety agencies need to interoperate with. An agency may own, maintain, or use communication assets.

Entering data for an agency involves entering data in the following areas, if applicable:
1. Agency Definition, high-level attributes (Table 1)
2. Radio System(s) that the agency owns/manages/uses (Section 3.2)
3. Channels and talk groups that the agency uses (Section 3.2)
4. Mutual Aid channels that the agency uses (Section 3.3)
5. Gateways that the agency owns/manages (Section 3.4)
6. Radio Caches that the agency owns/manages (Section 3.5)
7. Dispatch Centers that the agency owns/manages (Section 3.6)
8. Point(s) of Contact may be entered for an agency (Section 3.7)
9. Radio equipment that the agency uses (Section 3.8)

Table 1: Agency Data

Data	Notes
Agency Name	Required
Discipline	Required; options provided are: EMS, Fire, Government, Health Care, Highway Patrol, Police, Public Health, Public Safety Communications, Public Works, Sheriff, Other
Primary Jurisdiction	Required; a jurisdiction is a specific city, county or state
Agency Address	Optional
Other Entities Served	Optional; other jurisdictions that the agency serves
Comments	Optional
Capabilities	Optional; options provided are: HAZMAT, EOD, USAR

3.2 Radio System

Radio System Definition

In CASM, a radio system is a land mobile radio (LMR) system; an organized set of channels or talk groups that are used by an agency for communications. The channels are likely transmitted on one or more structures.

Entering data about a radio system involves entering data in the following areas:
1. Radio System Definition, high-level attributes (Table 2)
2. Agencies that use the system
3. Channels, if system is conventional or trunked (Table 3)
   a. Agencies that use each channel, if the system is conventional (non-trunked)
4. Talk Groups, if the system is trunked (Table 4)
   b. Agencies that use each talk group, if the system is trunked
5. Structures that support the system (Table 5)

6. Repeater/Base Station (RBS) information, for each structure, identifying the channels that are transmitted (Table 6)
7. Point(s) of Contact may be entered for a radio system and for a structure (Table 12)

Table 2: Radio System Data

Data	Notes
Radio System Name	Required
Owner/Responsible Agency	Required; options are provided from agencies entered previously
Agency use of system	Required; options are: Primary System (default), Secondary System
Number of Mobile Radios	Optional
Number of Portable Radios	Optional
Notes on Agency Use	Optional
Primary Make (Mfg)	Optional; options are provided
System Type	Optional; options provided are: Conventional (default), Trunked or Both
Model Name	Optional
Trunking Type	Optional, if trunked; options are provided
Frequency Band	Required; options are provided
Project 25 Compliant	Required; options are provided
Number of Channels	Optional
Encryption Protocol	Optional; options are provided
Year Installed	Optional; options are provided
Repeated / Simplex	Optional; options provided are: Repeated (default), Simplex, Both
Analog / Digital	Optional; options provided are: Analog (default), Digital, Both
Wideband / Narrowband	Optional; options provided are: Wideband (default), Narrowband, Both
Voted	Optional; yes (default) or no
Simulcast	Optional; yes (default) or no
Service Area Comments	Optional
Notes on System	Optional

Table 3: Channel Data

Data	Notes
Type of Tones	Required; options provided are: None, CTCSS, CDCSS, NAC, and Mixed Mode. The selected default is based on information about the radio system.
Frequencies to be entered	Required; options provided are: Tx Only, Rx Only, Both (default)
Transmit Frequency	Required for a Transmit Only or repeated channel from the Repeater perspective
Transmit Tone	Optional; options are provided based on selection above
Receive Frequency	Required for a Receive Only or repeated channel from the Repeater perspective

Data	Notes
Receive Tone	Required; options are provided based on selection above
Channel Name	Optional, but highly recommended as users often identify with this rather than the Tx/Rx frequency pair
Channel Description	Optional

Table 4: Talk Group Data

Data	Notes
Talk Group ID	Required
Talk Group Name	Optional, but highly recommended as users often identify with this rather than the talk group ID
Talk Group used by all	Required; yes or no (default). If the talk group is used by all agencies that use the radio system, then select "yes"
Talk Group Description	Optional

Table 5: Structures Data

Data	Notes
Structure Name	Required
Structure Owner	Optional
Structure Address	Optional
Latitude	Required; if an address is provided, CASM lookup feature may calculate the latitude
Longitude	Required; if an address is provided, CASM lookup feature may calculate the longitude
Structure Type	Optional
Ground Elevation	Optional; in meters
Structure Height	Optional; in meters
Receive Only Site	Optional; yes or no (default)
Room for more antennas?	Optional; yes (default) or no
Notes	Optional

Table 6: Repeater / Base Station Data

Data	Notes
For each structure that supports a radio system, the user may select one or more channels from the list already entered for the radio system. This step enables the user to identify the following repeater / base station attributes for each channel on a structure:	
Call Sign	Optional
Make (Mfg)	Optional; options are provided
Model	Optional
RBS - Type	Optional; options are provided
RBS - Name	Optional

Data	Notes
Antenna Type	Optional; options are provided
Antenna Height	Optional; in meters
RBS - Power	Optional; in Watts
RBS - Effective Radiated Power (ERP)	Optional; in Watts
Notes	Optional

3.3   Mutual Aid

Mutual Aid Definition

In CASM, a radio channel or set of channels (system) that has a name and is recognized or known to be used for interoperability on a national, regional or community basis. An example is the NPSPAC set of mutual aid channels.

Entering data about a Mutual Aid channel or system involves entering data in the following areas:

1. Mutual Aid Definition, high-level attributes (Table 7)
2. Agencies that use the mutual aid
3. Channels, if the set of channels is conventional (non-trunked) (Table 3)
   a. Agencies that use each channel
4. Talk Groups, if the mutual aid is trunked (Table 4)
   a. Agencies that use each talk group
5. Structures and Repeater/Base Station information may be entered for mutual aid channels in the same way as for Radio Systems (Table 5, Table 6)

Table 7: Mutual Aid Data

Data	Notes
Mutual Aid Name	Required
Frequency Band	Optional; options are provided
P25 Compliancy	Required; options are provided
Repeated or Simplex	Optional; options provided are: Repeated (default), Simplex, Both
Conventional or Trunked	Optional; options provided are: Conventional (default), Trunked or Both
Analog or Digital	Optional; options provided are: Analog (default), Digital, Both
Service Area	Optional
Primary Use	Optional

3.4   Gateway

Gateway Definition

In CASM, a gateway is an audio bridge device used by multiple agencies to provide interoperability between dissimilar radio systems.

Entering data about a gateway involves entering data in the following areas:
1. Gateway Definition, high-level attributes (Table 8)
2. Selecting channels and talk groups that are configured on the gateway from the channels and talk groups on radio systems and mutual aid channels/systems that have been entered previously.
3. Point(s) of Contact may be entered for a gateway (Table 12)

Table 8: Gateway Data

Data	Notes
Gateway Name	Required
Gateway Owner / Responsible Agency	Required; options are provided from agencies entered previously
Gateway Usage	Required; options provided are: Day-to-Day or Incident/Event
Gateway Make / Model	Optional; options are provided
Gateway Type	Optional; options provided are: Fixed or Mobile (default)
Number of Simultaneous Nets	Optional
Number of Active Ports	Optional
Address where gateway is stored	Optional
Mobile Service Area	Optional
Notes	Optional

3.5 Radio Cache

Radio Cache Definition

In CASM, a radio cache is a defined set of radios that is configured, stored, and available to support a response to an incident.

Entering data about a radio cache involves entering data in the following areas:
1. Radio Cache Definition, high-level attributes (Table 9)
2. Radio equipment that comprises the cache (Table 10)
3. Agencies that may deploy the cache
4. Selecting channels and talk groups that are configured on the cache from the channels and talk groups on radio systems and mutual aid channels/systems that have been entered previously. Channels that are configured on the cache, but do not appear in the select list may be entered at this point. (Table 3)
5. Point(s) of Contact may be entered for a radio cache (Table 12)

The Add New Cache Channel page, launched from the Radio Cache Channel page, enables you to enter channels (i.e., Tx/Rx pairs) programmed on the cache that are not part of a radio system. You may use this page to enter talk-around channels, for example.

Table 9: Radio Cache Data

Data	Notes
Radio Cache Name	Required
Cache Owner / Responsible Agency	Required; options are provided from agencies entered previously
Cache Radio Frequency Band	Optional; options are provided
Address where cache is stored	Optional
Cache Service Area	Optional
Notes	Optional

Table 10: Radio Cache Equipment

Data	Notes
Radio Make (Mfg.)	Required; options are provided
Radio Model	Required; options are provided
Number of Programmable Channels	Optional; per make/model
Number of Radios	Optional; quantity per make/model
Number of Spare Batteries	Optional; per make/model

3.6 Dispatch Center

Dispatch Center Definition

In CASM, a dispatch center is a place that provides dispatch service for one or more agencies. It may or may not also perform as a Public Safety Answering Point (PSAP), and may or may not provide console patches.

Entering data about a dispatch center involves entering data in the following areas:
1. Dispatch Center Definition, high-level attributes (Table 11)
2. Agencies that are served by the dispatch center
3. Other dispatch centers that are connected to the dispatch center.
4. Point(s) of Contact may be entered for a dispatch center (Table 12)

Table 11: Dispatch Center Data

Data	Notes
Dispatch Center Name	Required
Dispatch Center Owner / Responsible Agency	Required; options are provided from agencies entered previously
Address	Optional
PSAP	Optional; yes or no

Data	Notes
Dispatch Center Equipment Make / Model	Optional; options are provided
Number of Simultaneous Console Patches	Required
Comments	Optional

3.7   Point of Contact

Point of Contact (POC) Definition

In CASM, a point of contact is a person who serves as a primary or secondary point of contact for an agency, radio system, dispatch center, gateway or radio cache. The information for a person need only be entered one time and may be linked to multiple communication assets. For example, if John Smith is the POC for City Police Department and he is also the POC for the City Police Dept's gateway, named "City Gateway", John Smith's contact information only needs to be entered once and then linked to both City Police Department and to City Gateway.

The user may view Point of Contacts from the perspective of the communication asset or from the prospective of the contact. Using the example above, the user could see that John Smith is the POC for City Police Department by clicking the POC link from the City Police Department record, or could see that John Smith is the POC for City Police Department and City Gateway by clicking the John Smith's link from the POC page.

Entering data about a point of contact involves entering data in the following areas:
1. Point of Contact Definition (Table 12)
2. The communication asset(s) that the person is the POC for.

Table 12: Point of Contact Data

Data	Notes
Contact Last Name	Required (if Company Name is not provided)
Contact First Name	Optional
Contact Middle Initial	Optional
Contact Suffix	Optional; e.g. Jr. III
Contact Personal Title	Optional; e.g. Capt., Lt., PhD
Company / Organization	Required (if Last Name is not provided)
Job Title	Optional
Address	Optional
Email Address	Optional
Office Phone	Optional
Cell Phone	Optional
Fax Number	Optional
Pager Number	Optional

Data	Notes
Category of Communication Asset that person is the POC for	Required (if user is entering a POC without first selecting a communication asset), options are provided
Specific Communication Asset that person is the POC for	Required (if user is entering a POC without first selecting a communication asset), options are provided
POC Type	Required; options are provided
Primary Contact	Optional; yes (default) or no

3.8   Agency Radios

Radio Definition

In CASM, a radio is any mobile or portable radio equipment used by agencies for communications.

Entering data about radios involves entering data in the following areas:
   1.   Radio Definition (Table 13)

Table 13: Radio Equipment Data

Data	Notes
Radio Make (Mfg)	Required; options are provided
Radio Model	Required; options are provided
Quantity of Fielded Radios	Optional
Notes	Optional
Year Purchased	Optional
Quantity Purchased per year	Optional

3.9   Talk Partners

Talk Partner Definition

In CASM, a talk partner is any public safety agency that your agency needs to talk to. Users may identify their agency's level of "need to talk" with other agencies as: daily/often, sometimes, rarely/never, or undecided/unknown.

Entering data about talk partners involves selecting an Agency from Agency Usage and entering data in the following areas:
   1.   Agency Talk Partners (Table 14)

Table 14: Talk Partner Data

Data	Notes
Select Jurisdiction	Required; list of jurisdictions is provided
Agency Name – Need to Talk	Required; all agencies within selected jurisdiction are listed; options provided are: Daily/Often, Sometimes, Rarely/Never, and Undecided/Unknown (default). At least one partner/relationship required.

Appendix A: Acronyms

Acronym	Meaning
CAM	Communication Assets Mapping component
CAS	Communication Assets Survey component
CASM	Communication Assets Survey and Mapping Tool
CDCSS	Continuous Digital Controlled Squelch System; also DCS, Digital Coded Squelch
CTCSS	Continuous Tone Coded Squelch System
EMS	Emergency Medical Services
EOD	Explosive Ordinance Device
ERP	Effective Radiated Power
FCC	Federal Communications Commission
HAZMAT	Hazardous Materials
ICTAP	Interoperable Communications Technical Assistance Program
LMR	Land Mobile Radio
NAC	Network Access Code
NPSPAC	National Public Safety Planning Advisory Committee
POC	Point of Contact
PSAP	Public Safety Answering Point
RBS	Repeater / Base Station
USAR	Urban Search and Rescue